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How We Know That They Know That . . .

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WHEN American military forces were training to rescue the American hostages in Iran in 1980, they feared that mock landing strips and replicas of the American Embassy in Teheran being built in the United States might be detected by Soviet satellites. Defense Department officials had similar fears that prototypes of so-called Stealth aircraft, planes designed to elude radar coverage, would be spotted by cameras aboard Soviet satellites as they passed over manufacturing sites in southern California.

These concerns were small facets of a multi-billion dollar secret war of surveillance waged 24 hours a day, seven days a week by the United States and the Soviet Union with fleets of satellites, airplanes, ships, submarines and an extensive network of land-based listening posts. In recent days, the public has gotten a rare glimpse of that war as the Reagan Administration made public recordings of Soviet pilots stalking and attacking a South Korean airliner over Sakhalin Island off the Siberian coast. It also disclosed details about the flight of an American spy plane in the same area as the Korean plane.

The recordings of Soviet pilots were made by Japan, which is one of the American allies that participate in a global surveillance network directed by the Defense Department, the Central Intelligence Agency and, in particular, the National Security Agency, the nation's largest and most secretive intelligence organization. American officials declined to say exactly how the Japanese intercepted the Soviet communications, but intelligence experts said the Japanese operate several electronic eavesdropping stations on Hokkaido, the northernmost Japanese island. Such stations are equipped with highly sensitive monitoring equipment that can pick up radio and microwave transmissions. The United States Air Force's 6920th Electronic Security Group is also based on Hokkaido and there are other posts near Tokyo and Yokohama.

The United States first got into large-scale surveillance activity in the late 1950's with the development of the U-2, a sophisticated, high-flying spy plane, followed shortly thereafter by the first surveillance satellites. The original purpose was to supplement intelligence collected by human agents. Over the years, as the technology of spying has advanced rapidly, the United States and the Soviet Union have come to depend primarily on electronics to keep track of military developments.

Keeping Tabs

With the advent of arms control agreements, the two nations used their reconnaissance systems as the main means of verifying compliance by keeping tabs on the testing, production and deployment of new missiles, warheads, and delivery systems. American officials said the United States' RC-135 reconnaissance plane that was flying off the Kamchatka Peninsula the night the Korean airliner was shot down was on a mission to collect information about a Soviet missile test expected that evening. Such flights are common along the Siberian coast.

Ground stations, which collect information on Soviet missile tests and also monitor commun-

cations in the Soviet Union and Eastern Europe, are located in Western Europe, Turkey, China, Australia, Japan and the United States. The Soviet Union, lacking equivalent access to nations neighboring the United States, maintains a communications intercept post in Cuba and keeps more than 30 surveillance ships and submarines off the American coasts. The United States and the Soviet Union also operate intercept equipment in their respective embassies in Moscow and Washington. At one point, in the 1970's, technicians at the embassy in Moscow were able to monitor the conversations of senior Kremlin officials as they talked on car telephones.

The most powerful tools for surveillance, however, are satellites. The United States operates at least three different kinds. The first photo-reconnaissance satellites, which fell out of orbit after several days or weeks, took photographs and then ejected the film in canisters to be recovered by planes as they descended by parachute toward earth. Today, the most advanced satellite, called a KH-11, can stay aloft for several years and sends images back to earth electronically, giving intelligence officials what is known in the trade as near real-time pictures. For example, within moments after a satellite has passed over a high-priority target such as the missile test facilities in Leninsk or Sary-Shagan in the southern Soviet Union, officials in Washington can look at television-like pictures of the installations. Highly advanced optics specially designed for the cameras produce high resolution images of objects as small as a tire.

Soviet photo-reconnaissance satellites are said to be less sophisticated, still dropping film in canisters and falling out of orbit after several months. But what the Russians lack in quality they make up in quantity, launching at least five satellites for each one sent up by the United States. The Soviet Union also has the advantage of having to watch a much smaller area and of a society that does not disclose many of its military activities in the press.

Other kinds of American and Soviet satellites, operating in stationary orbit 22,300 miles above the Earth, monitor microwave communications and have infrared sensors to detect the launch of missiles. These serve as crucial links in both nations' early-warning systems. Despite all the technology, however, American officials say that most of what happens in the Soviet political and military establishments remains secret. They noted, for example, that American surveillance failed to detect communications that might show where in the Soviet hierarchy the decision was made to down the Korean airliner.

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